

Notice of Allowability

Application No.

10/533,207

Examiner

Charles Chow

Applicant(s)

SHIRAKATA ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/27/2007.
2. ☒ The allowed claim(s) is/are 1,5 and 7-11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>4/28/2005</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Detailed Action

1. This office action is for amendment received on 4/24/2007.

Allowable Subject Matter

2. The following is an examiner's statement of reasons for allowance:

Claims 1, 5, 7-11 are allowable over the prior art of record. The prior arts fail to teach the allowable features, singly, particularly, or in combination.

Applicant has amended independent claims 1, 11 with the features from objected claims 4 & portion of claim 2, to distinguish the claimed features from the claims of the co-pending application 11/262,822, for the Double Patenting in the last office action [page 9 of applicant's amendment, 4/24/2007].

The cited prior arts fail to teach the allowable features for the diversity antenna selecting based on the highest average power measured among all average powers measured, using the second gain, having the average powers measured on an averaging period by averaging period, for the packet symbols of multiple repetitions of a pattern signal, together with the gain control, having the second fixed gain which is lower than the first fixed gain, & allows the antenna to switching section to sequentially switch the selection of antennas during the antenna switching period so that the plurality of antennas are all selected, in the following,

the apparatus comprising a plurality of antennas...; an antenna switching section...; and gain amplifier section...; a gain control section...; a power measurement section...;

an averaging section for taking an average of the instantaneous power measured by the power measurement section on an averaging period-by-period basis, and measuring the average powers, the averaging period having the same time length as on period of the pattern signal; and

a control section for controlling the gain control section so that the gain amplifier section has a desired gain, and controlling of the antenna made by the antenna switching section wherein

during all or part of a time period during which the pattern signals are received, the control section allows the gain control section to fix the gain of the gain amplifier section, allows the antenna switching section to sequentially switch the selection of antennas during antenna switching period which are synchronized with the averaging periods, and determines an antenna to receive data contained in the packet, based on levels of the average powers measured by the averaging section on an averaging period-by-averaging period basis,

during a waiting time for the pattern signals, the control section controls the gain control section such that the gain amplifier section amplifies the received signal with a first fixed gain and allows the antenna switching section to sequentially switch the selection of antenna during the antenna switching periods,

If any of the level of the average powers measured by the averaging section during the waiting time for the pattern signals exceeds a first threshold value, the control section determines as the antenna to receive the data an antenna which had been selected during an averaging period where the highest average power was measured,

the if any of the levels of the average powers measured by averaging section during the waiting time for the pattern signals exceeds a second threshold value which is higher than the first threshold value,

the gain amplifier section amplifies the received signal with a second fixed gain which is

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lower than the first fixed gain, and allows the antenna to switching section to sequentially switch the selection of antennas during the antenna switching period so that the plurality of antennas are all selected, and

the control section determined as the antenna to receive the data as antenna which had been selected during an averaging period where the highest average power was measured among all average powers measured using the second gain.

The dependent claims are also allowable due to their dependency upon the allowable independent claims above and the having additional claimed features.

The closest prior art, **Terao [US 2004/0214,529 A1]**, teaches the antenna switching 2 for selecting of antennas A, B, controlled by 7 or 5 [paragraph 0014-0015, Fig. 1], the gain amplifier section 101 & 106a/106b, the gain controller 107, the averaging power calculator 3 for storing of calculated, the average power for gain calculator 4, paragraph 0017, 0027],

but fails to teach the receiving a packet symbols with multiple pattern repetitions; the averaging period-by-averaging period basis; the averaging period having the same time length as one period of the pattern signal; & the if any of the levels of the average powers measured by averaging section during the waiting time for the pattern signals exceeds a second threshold value which is higher than the first threshold value,

the gain amplifier section amplifies the received signal with a second fixed gain which is lower than the first fixed gain, together with the features for,

the control section determined as the antenna to receive the data as antenna which had been selected during an averaging period where the highest average power was measured among all average powers measured using the second gain.

Saed et al. [US 2004/0266,374 A1] teaches the receiving of the packet 60 [Fig. 7] having preamble 62 [paragraph 42], the averaging power/rssi over a given period of the

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preamble, paragraph 0044, 0015], the when average power 106 is greater than the threshold thr_Great [step 106], to select antenna A at step 108, otherwise to select antenna b at steps 110, Fig. 8], but fails to teach the features missed by Terao.

Other prior arts in below are also considered, but they fail to teach the above allowable features.

Ando [US 5,241,701] teaches the antenna selection based on the maximum time integrated value of the electric field level during the time slot period [Fig. 1, abstract].

Matsui et al. [US 6,985,544] teaches the measuring of the mean SNR of the receiving frame & estimating of the SNR for comparison with the received SNR to control the antenna selection [abstract, Fig. 1].

Ono [US 6,947,716] teaches the antenna switching based on the noise detection sensitivity with a varying threshold to improve the reception [abstract, Fig. 1-2].

Takahashi et al. [US 5,918,164] teaches the controlling of the mean values for preventing the unnecessary antenna switching [abstract, Fig. 3-5].

Taromaru [US 5,548,836] teaches the antenna switching based on the received signal intensity & the antenna switching threshold level from 370 corresponding to the fading speed detected by the fading speed detector 340 [abstract, Fig. 1].

Jager [US 6,330,433] teaches the antenna selection for subsequent signal based on the best signal quality [Fig. 1, abstract].

Other prior arts are also considered. They are: **Kawada et al. (US 2006/0133,544 A1), Wang (US 2006/0135,097 A1), Ramakrishnan et al. (US 2004/0179,495 A1), Wilhelmsson et al. (US 2002/0086,648 A1), Hovers et al. (US 2006/0030,365 A1), Kishimoto et al. (US 2002/0118,724 A1), Change et al. (US 5,692,019), Yamaguchi et al.**

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(US 2002/0039,912 A1), Gottfried et al. (US 5,603,107), Takahashi et al. (US 5,634,204), Murai (US 5,239,541).

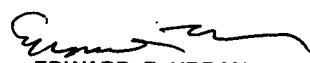
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow 

May 11, 2007.


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